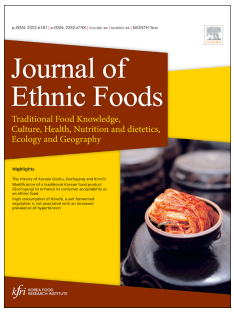
Accepted Manuscript



Extruded black gram flour: partial substitute for improving quality characteristics of Indian traditional snack

Laxmi Ananthanarayan, Yogesh Gat, Vikas Kumar, Anil Panghal, Narinder Kaur

PII: S2352-6181(17)30132-4

DOI: 10.1016/j.jef.2017.10.001

Reference: JEF 128

To appear in: *Journal of Ethnic Foods*

Received Date: 24 July 2017

Revised Date: 6 October 2017

Accepted Date: 10 October 2017

Please cite this article as: Ananthanarayan L, Gat Y, Kumar V, Panghal A, Kaur N, Extruded black gram flour: partial substitute for improving quality characteristics of Indian traditional snack, *Journal of Ethnic Foods* (2017), doi: 10.1016/j.jef.2017.10.001.

Extruded black gram flour: partial substitute for improving quality characteristics of Indian traditional snack

Laxmi Ananthanarayan[a], Yogesh Gat[b*], Vikas Kumar[b], Anil Panghal[b] and Narinder Kaur[b]

[a]Department of Food Engineering and Technology

Institute of Chemical Technology, Matunga, Mumbai-400 019, India

[b]Department of Food Technology and Nutrition,

Lovely Professional University, Phagwara-144 411, India

***Corresponding author:**

Dr. Yogesh Gat, (Email: yogeshcft10@gmail.com),

Food Technology and Nutrition Department,

Lovely Professional University, Jalandhar- 144 411 (India).

Abstract

Background: During extrusion of black gram flour formation of amylose-lipid complexes lowers down the gelatinization enthalpy of extrudates. While partially gelatinized black gram starch leads to lowering down the water holding capacity and alter functional properties resulting in changing quality attributes of end product upon frying/microwaving/roasting.

Methodology: Attempts have been made to improve quality of Indian traditional snack (e.g. *papad*) by incorporating extruded black flour as partial substitute for raw (un-extruded) black gram flour. In present work overall quality improvement was achieved by analyzing (a) pre and post frying characteristics (diameter, moisture content, expansion ratio, oil uptake, texture and colour) of papad and, (b) physical properties (colour and viscosity) of fried oil.

Results: Four different *papad* samples were prepared (control *papads* without addition of *papadkhar*, *papads* with use of 3% *papadkhar*, *papads* with incorporation of extruded black gram flour at 25% concentration, *papads* with incorporation of extruded black gram flour at 50% concentration along with 1% *papadkhar*) and analyzed along standard market sample. Incorporation of extruded black gram flour in *papad* resulted in greater expansion with lower oil uptake in fried *papad*. Further addition of extruded black gram flour permitted use of lower concentration of *papadkhar*. Post-frying quality of oil was characterized after numerous frying cycles.

Conclusion: Oil used for frying of *papads* containing highest concentration of *papadkhar* was effective only up to two frying cycles, after which colour and viscosity increased significantly, adversely affecting quality fried oil.

Keywords